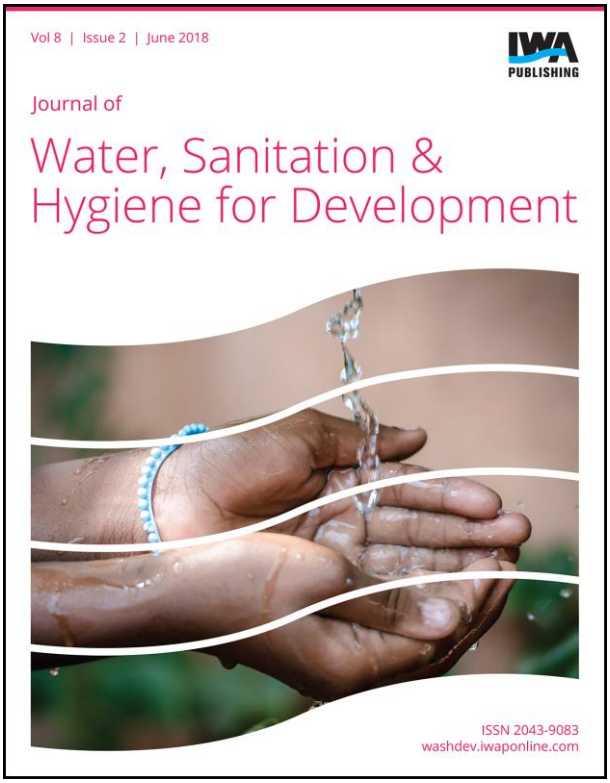

Research Paper

Communal latrine utilization and associated factors in Addis Ababa, Ethiopia: a community-based cross-sectional study

Elzabeth Girma Kefeni and Walelegn Worku Yallew

ABSTRACT

Despite the quick urban population growth increased volume of wastes, including human excreta, which demands an expanded need of infrastructure, solid institutional setup and communities' engagement for management of safe disposal of excreta, arrangement of such basic social services has not developed as per the rate of population growth. Mostly, communal latrines are inclined towards an absence of cleanliness, as they accommodate many people beyond their capacity, filling up septic tanks quickly. A community-based cross-sectional study conducted in 817 randomly selected communal latrine user households, five focus group discussions and four key informant interviews were analysed. Bivariate and multivariate logistic regression analysis was performed to discover the impact of different factors on the use of communal latrines. The findings revealed that the rate of communal latrine use in Addis Ababa was about 79.8%. Unhygienic conditions, latrine emptying challenges, extreme smell, number of family units sharing the same squats, and latrine designs for the aged and children were identified as barriers to latrine utilization. This study suggests that, in parallel with the continued investments to increase access to sanitary facilities in the city, the management and behavioural change part has likewise to be stressed for better use and sustainability.

Key words | barriers of latrine use, communal latrine, Ethiopia, latrine use

Elzabeth Girma Kefeni
UNICEF – Ethiopia,
Addis Ababa,
Ethiopa

Walelegn Worku Yallew (corresponding author)
Department of Environmental and Occupational Health and Safety,
University of Gondar College of Medicine and Health Sciences, Institute of Public Health,
P Box-196, Gondar,
Ethiopia
E-mail: *walelegnw@gmail.com*

INTRODUCTION

Illnesses related to contaminated drinking water, unsanitary food preparation, unimproved excreta disposal and unclean household environments constitute a major burden on the health of people in the developing world and are among the leading causes of ill-health (UNICEF 2005).

Less than two-thirds of the world's population uses improved sanitation facilities. Getting adequate sanitation is generally a challenge in most urban poor communities in Africa and Asia due to deprived service provision, dense populations and limited availability of land to build new latrines once the old ones are full (Mulenga 2011). In the low-income areas of fast growing cities close to 5,000 children under five years old are dying every day because of lack of access to basic sanitation (Hawkins *et al.* 2013).

Where well-established sanitation systems are not possible, well-built and maintained communal toilets will probably offer an acceptable solution for many urban slums (WHO and UNICEF 2006), although facing a lack of clarity of a shared sanitation definition (Isunju *et al.* 2011), the Joint Monitoring Programme (JMP) has created a specific group found between improved and unimproved on the sanitation ladder (JMP 2008).

According to the latest JMP of the United Nations Children's Fund (UNICEF) and World Health Organization

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(WHO), basic and improved household sanitation coverage in Ethiopia is 63%. According to the 2007 census, about 80% of the housing units in Addis Ababa city use private or shared on-site disposal sanitation facilities. Only 6 to 7% of the housing units enjoy an off-site disposal system and the remaining 13 to 14% of houses in the city do not have a latrine facility at all. Only about 12% of the latrines in Addis Ababa are connected to septic tanks (Beale 2002; AAWSA 2014).

This study is important to establish factors that influence communal latrine use in the urban context and to fill the gap in the empirical literature and provide insight into the opportunities for further improvement of safe excreta disposal. If provision of communal sanitation facilities is a key strategy in sanitation service for the urban poor, better understanding of barriers and facilitating factors associated with their use is very important.

METHODS

A community-based cross-sectional study was conducted in Addis Ababa city, the biggest and the capital city of Ethiopia. The sample size was calculated using a single proportion formula with expected proportion 58.1% (AAWSA 2014; Beyene *et al.* 2015), 95% confidence interval, 5% margin of error, design effect 2 with 10% non-response rate. The city is divided into 10 sub-cities which are ranked the second administrative units next to city administration. Addis Ababa was selected from the point of view that it has the largest population of communal latrine users compared to all towns in Ethiopia.

A multi-stage sampling approach was used as follows: at stage one, four sub-cities were selected with a simple random sampling technique using Microsoft Excel application. At stage two, the sample size was shared proportionally to districts considering communal latrine user communities under each sub-city's systematic sampling. At stage three, eligible households were selected using the district level data through systematic sampling. Where there were no data at district level, households were randomly selected. In this study, communal latrines are latrines shared by a group of households in the community. Latrine utilization means households with functional latrines and all family members use the communal latrine for excreta disposal regularly.

A pre-tested, standardized and structured questionnaire was administered to all study subjects at household level about communal latrine use. Furthermore, four key informant interviews (KII) were conducted with the district experts who were involved directly in communal latrines, management and with two non-government organizations (NGOs) supporting the management. Respondents were interviewed in a local language, Amharic, after making sure of the uniformity and clarity of the English questionnaire. Data were entered into Epi Info 3.5.3 and, after cleaning, the data were exported and analysed using SPSS version 20 software. Field supervision and daily meetings during data collection were used to confirm data quality. Eight experienced data collectors were recruited and trained before the data collection.

Bivariate and multivariate logistic regression analyses were performed to determine the odds ratio and adjusted odds ratio for the association of selected independent variables. The significance level was defined as a p-value of less than 0.05. To avoid an excessive number of variables and unstable estimates in the subsequent model, only variables that reached a p-value of less than 0.3 were kept for subsequent analysis. Descriptive statistics was performed using frequency distribution and percentage for dependent and independent variables was generated.

The qualitative data from focus group discussions and KII were digitally recorded then transcribed to a written form in Amharic with the basic level transcription then translated into English. Coding of the related segments and organizing segments of data into categories was performed using Open Code version 4.0.2 software. Ethical approval was obtained from the ethical board of Addis Continental Institute of Public Health and Addis Ababa Regional Health Bureau.

RESULTS

Socio-demographic characteristics

A total of six demographic variables was investigated: area of residence, gender, age, occupation, education and household size (Table 1).

Table 1 | Socio-demographic characteristics of study subjects in Addis Ababa, December 2015

Characteristics	N	%
Family size ($N = 817$)		
< 6	661	80.9
≥ 6	156	19.1
Educational status of the mother ($N = 747$)		
Illiterate	318	42.6
Read and write	54	7.2
Primary and above	375	50.2
Educational status of the father ($N = 516$)		
Illiterate	68	13.2
Read and write	57	11
Primary and above	391	75.8
Marital status ($N = 817$)		
Single	81	9.9
Married	439	53.7
Widowed	231	28.3
Divorced	66	8.1
Number of children under five ($N = 261$)		
One	226	86.6
Two	29	11.1
Three	6	2.3
Occupational status of mother ($N = 750$)		
Housewife	376	50.1
Employed and self-small business	280	37.3
Retired	76	10.1
Others	18	2.4
Occupational status of father ($N = 514$)		
Unemployed	22	4.3
Employed and self-small business	398	77.4
Retired	81	15.8
Others	13	2.5
HHs have children in elementary or secondary school ($N = 817$)		
Yes	496	60.7
No	321	39.3

Environmental characteristics

Most (95%) of the communal latrines were pit latrines, of which 56.4% were constructed between 1 and 15 years ago and 468 (57.3%) of them were constructed by NGOs. A total of 20 different NGOs that constructed communal latrines were registered during the study.

Behavioural characteristics

Based on the study results, out of the 817 respondents who have access to communal latrines, 652 respondents (79.8%) explained that all family members used the communal latrine regularly. The main reasons reported for not using the latrines are extreme smell, far distance, inaccessibility at night, not comfortable for the children and for ill or elderly people. The remaining 152 respondents (20.2%) were not regular users of the communal latrines and most of them (81.2%) used open defecation as the alternative solution.

Predictors of regular communal latrine use

The selected variables were examined in the logistic regression to discover their relative effects on the extent of regular communal latrine utilization (Table 2).

Barriers of regular communal latrine use

In an effort to explore barriers to latrine utilization, findings of the focus group discussion and KII provided insights, which are categorized into six themes: (i) poor latrine emptying service provision, (ii) substandard designs of latrine; (iii) low access to latrines, (iv) affordability, (v) unhygienic conditions and (vi) absence of legitimate monitoring and support by the partners.

DISCUSSION

In this study, the findings revealed that the rate of communal latrine use in Addis Ababa among the communal latrine users was 79.8%. The rate of communal latrine use confirms that the availability of communal latrines does not necessarily lead to regular latrine usage (Biran *et al.* 2011). This finding was comparable with the studies done with household latrines in Arbaminch town (69.7%) (Shiferaw 2014). The variation among different studies is partly explained by the differences in the study population and related

Table 2 | Summary of the hierarchical logistic regression analysis of socio-demographic, environmental and behavioural factors on regular communal latrine utilization in Addis Ababa city, December 2015

		Latrine utilization			
Variable	**Characteristics**	**Yes**	**No**	**COR (95%CI)**	**AOR (95% CI)**
Age	≤40	166 (89.7)	19 (10.3)	2.625 (1.577–4.368)	2.171 (1.284–3.671)[a]
	>40	486 (76.9)	146 (23.1)	1	1
Family size	≤6	538 (81.4)	123 (18.6)	1.611 (1.075–2.415)	1.531 (1.002–2.341)[a]
	>6	114 (73.1)	42 (26.9)	1	1
Educational status of father ($N = 516$)	Illiterate	41 (60.3)	27 (39.7)	0.249 (0.142–0.437)	0.286 (0.161–0.508)[a]
	Read and write	40 (70.2)	17 (29.8)	0.385 (0.204–0.727)	0.435 (0.228–0.828)[a]
	Primary and above	336 (85.9)	55 (14.1)	1	1
Educational status of mother ($N = 747$)	Illiterate	221 (69.5)	97 (30.5)	0.272 (0.181–0.408)	0.347 (0.194–0.623)[a]
	Read and write	38 (70.4)	16 (29.6)	0.284 (0.145–0.554)	0.238 (0.099–0.572)[a]
	Primary and above	335 (89.3)	40 (10.7)	1	
Presence of children under five	No	453 (81.5)	103 (18.5)	1.37 (0.959–1.957)	1.507 (1.032–2.201)[a]
	Yes	199 (76.2)	62 (23.8)	1	1
Ownership of the house	Owned	107 (76.4)	33 (23.6)	0.849 (0.549–1.313)	0.815 (0.521–1.275)
	Rented from individual	56 (93.3)	4 (6.7)	3.665 (1.305–10.297)	3.1 (1.085–8.857)[a]
	Rented from Government	489 (79.3)	128 (20.7)	1	1
Distance of the latrine	<10 meters	412 (87.3)	60 (12.7)	2.715 (1.779–4.142)	2.653 (1.728–4.072)[a]
	10–15 meters	111 (67.3)	54 (32.7)	0.813 (0.513–1.286)	0.771 (0.482–1.232)
	>15 meters	129 (71.7)	51 (28.3)	1	1
Cleaning frequency	Daily	155 (88.1)	21 (11.9)	3.28 (1.447–7.438)	3.4 (1.513–8.054)[a]
	Once/3 days	125 (83.9)	24 (16.1)	2.315 (1.032–5.194)	2.625 (1.148–6.002)[a]
	Once/week	144 (74.6)	49 (25.4)	1.306 (0.615–2.774)	1.339 (0.619–2.896)
	When dirty	201 (77.3)	59 (22.7)	1.514 (0.723–3.171)	1.597 (0.748–3.410)
	Other	27 (69.2)	12 (30.8)	1	1
Who requests the service	Designated HH	8 (53.3)	7 (46.7)	0.255 (0.091–0.716)	0.219 (0.074–0.651)[a]
	All HH turn by turn	12 (44.4)	15 (55.6)	0.179 (0.082–0.390)	0.162 (0.072–0.367)[a]
	Committee	53 (79.1)	14 (20.9)	0.845 (0.455–1.569)	0.841 (0.447–1.582)
	Collectively	**578 (81.8)**	**129 (18.2)**	**1**	**1**

[a]Only variables that reached *p*-value less than 0.3 were kept in the subsequent analyses and displayed in the table.

factors, in addition to differences in study designs and operational definitions of the outcome of interest. In this study, from the socio-demographic variables considered, age of the household head (HH), family size, educational status of mother and father showed significant associations with communal latrine use. This was consistent with the studies conducted in Samburu County in Kenya (Waithaka 2015). This explained that the level of education of the mother and father has a direct influence on health-related decisions and good latrine use practices at household level.

The least use of the latrine by elderly people was related to their mobility, morbidity, convenience of the latrine superstructure and distance. Family size had an impact on communal latrine use, explained in terms of low latrine access per person. Findings of the focus group discussions also indicated that several larger households share the same squats, and inappropriate designs for the elderly and children were explained as a barrier for regular use. This study did not find an association between the presence of school-aged children in a household with the outcome variable, which has previously been shown to impact latrine utilization (Anteneh & Kumie 2010).

From the environmental variables considered, ownership of the house, area of residence and distance of latrines showed significant associations with communal latrine use. This is in line with earlier studies (Ashebira *et al.* 2013; Ayesu *et al.* 2015; Routray *et al.* 2015). Similar findings were also reported from Siasa, Kenya, in a study in

which the elderly, women and children were found to be reluctant to use latrines constructed at far distances from their compounds due to the problem of access, especially during the night (LaFond 1995). Usually, a latrine located closest to the house was convenient to use and likely to be used by the household, whereas in this study, accessibility at night, privacy and number of user household per one seat were not statistically associated with outcome variable.

From the behavioural variables considered, cleaning frequency of latrine, especially daily and every 3 days, is shown to have a significant effect on latrine use. In addition, having knowledge about the best types of latrines had a significant impact on communal latrine utilization. This is in line with previous studies (Mazeau 2013; Nelson *et al.* 2014; Isunju *et al.* 2011).

In an effort to explore barriers to latrine utilization, findings of the focus group discussion and KII provided insights that latrine emptying services were the major challenge. This was explained in terms of delay of the service provision and access to the latrine locations. This leads to unhygienic conditions and extreme smell which prevented users from using the latrine. In areas where there is no road access to the large emptying vehicle, communities were obliged to undertake manual emptying of the latrine by daily labour and disposal of contents into the river. This study finding was in line with previous studies conducted in Ghana and Madagascar (Mazeau 2013; Obeng *et al.* 2015).

Substandard designs of the superstructure of the latrine hindered the use by the old and children; this was consistent with the quantitative study finding and other studies in Ghana (Obeng *et al.* 2015). The majority of communities sharing a single squat of a communal latrine for many people ranged from 5 to 50 people; this implies the latrine will be overburdened with high faecal load which results in a frequent need of emptying which makes the VIP inappropriate for communal use (Mazeau 2013; Obeng *et al.* 2015). This is also related to the affordability of the cost when frequent emptying service and maintenance are required.

Poor management practices such as inadequate cleaning and failure to empty on time results in intense smell, and these factors were stated to be barriers from using latrines, especially for children and the elderly. This result is in line with previous studies in Madagascar and Ghana (Mazeau 2013; Obeng *et al.* 2015). Sustained demand for use of latrines will depend on them being clean and without smell. If the system for cleaning breaks down, the facility will become unpleasant to use. KII with health extension workers and NGO workers revealed that the health extension workers are supporting the communities only in raising awareness regarding hygiene activities and are not in a position to make decisions. Monitoring of these communal latrines by the government, as well as the NGOs, has been very poor and service arrangements are haphazard. It seems there is less clarity regarding the institutional roles and responsibility for communal latrine management in the government structure is scattered.

CONCLUSION

This study provided evidence on the magnitude of communal latrine utilization in the studied area. The household survey indicated that age of the household head, family size, educational status of mother and father, ownership of the house, area of residence and distance of latrines, and cleaning frequency of latrines are shown to determine latrine utilization of the household. The most important factors recognized by the focus groups and KII as influencing the decision to use or avoid a latrine were unhygienic conditions, emptying challenges, extreme smell, high number of households sharing the same squats, and non-user friendly latrine designs for the elderly and children.

In view of the above confirmations of the present investigation, the following suggestions are recommended: To amplify latrine utilization by elderly people and children, the design of the latrines and the distances from their homes should be considered. Increase in the number of blocks of latrines will reduce the number of households per latrine squats, which decreases the complexity of communal latrine management.

Working on the behavioural change in communities on latrine use and management can improve communal latrine utilization. Latrine emptying challenges related to affordability need further ability to pay for a study of the communal latrine user community.

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